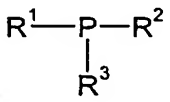
WHAT IS CLAIMED IS:

1. A method of dimerizing isocyanates comprising reacting isocyanate functional compounds in the presence of phosphines containing at least one cycloaliphatic radical attached directly to phosphorus as catalysts resulting in the formation of uretdiones.

2. The method of Claim 1, wherein the phosphines comprise phosphines described by formula I:



(I)

wherein

R^1 represents a C_1-C_{12} alkyl- or alkoxy-substituted cycloaliphatic C_3-C_{20} radical, and

R^2 and R^3 are each independently selected from C_1-C_{12} alkyl- or alkoxy-substituted cycloaliphatic C_3-C_{20} radical and a linear or branched aliphatic C_1-C_{20} radical.

3. The method of Claim 1, wherein the phosphines comprise a compound selected from the group consisting of cyclopentyldimethylphosphine, cyclopentyl-diethylphosphine, cyclopentyl-di-n-propylphosphine, cyclopentyl-di-isopropylphosphine, cyclopentyl-dibutylphosphine, cyclopentyl-dihexylphosphine, cyclopentyl-dioctylphosphine, dicyclopentyl-methylphosphine, dicyclopentyl-ethylphosphine, dicyclopentyl-n-propylphosphine, dicyclopentyl-isopropylphosphine, dicyclopentyl-butylphosphine, dicyclopentyl-hexylphosphine, dicyclopentyl-octylphosphine, tricyclopentylphosphine, cyclohexyl-dimethylphosphine, cyclohexyl-di-

ethylphosphine, cyclohexyl-di-n-propylphosphine, cyclohexyl-di-isopropylphosphine, cyclohexyl-dibutylphosphine, cyclohexyl-dihexylphosphine, cyclohexyl-dioctylphosphine, dicyclohexyl-methylphosphine, dicyclohexyl-ethylphosphine, dicyclohexyl-n-propyl-phosphine, dicyclohexyl-isopropylphosphine, dicyclohexyl-butylphosphine, dicyclohexyl-hexylphosphine, dicyclohexyl-octylphosphine, and tricyclohexylphosphine.

4. A process for preparing polyisocyanates containing uretdione groups, comprising reacting

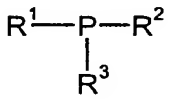
a) at least one organic isocyanate,

b) a catalyst comprising at least one phosphine containing at least one cycloaliphatic radical attached directly to phosphorus,

c) optionally one or more solvents, and

d) optionally one or more additives.

5. The process of Claim 4, wherein the phosphines comprise phosphines described by formula I:



(I)

wherein

R^1 represents a C_1-C_{12} alkyl- or alkoxy-substituted cycloaliphatic C_3-C_{20} radical, and

R^2 and R^3 are each independently selected from C_1-C_{12} alkyl- or alkoxy-substituted cycloaliphatic C_3-C_{20} radical and a linear or branched aliphatic C_1-C_{20} radical.

6. The process of Claim 1, wherein the phosphines comprise a compound selected from the group consisting of cyclopentyldimethylphosphine, cyclopentyl-diethylphosphine, cyclopentyl-di-n-propylphosphine, cyclopentyl-di-isopropylphosphine, cyclopentyl-dibutylphosphine, cyclopentyl-dihexylphosphine, cyclopentyl-dioctylphosphine, dicyclopentyl-methylphosphine, dicyclopentyl-ethylphosphine, dicyclopentyl-n-propylphosphine, dicyclopentyl-isopropylphosphine, dicyclopentyl-butylphosphine, dicyclopentyl-hexylphosphine, dicyclopentyl-octylphosphine, tricyclopentylphosphine, cyclohexyl-dimethylphosphine, cyclohexyl-diethylphosphine, cyclohexyl-di-n-propylphosphine, cyclohexyl-di-isopropylphosphine, cyclohexyl-dibutylphosphine, cyclohexyl-dihexylphosphine, cyclohexyl-dioctylphosphine, dicyclohexyl-methylphosphine, dicyclohexyl-ethylphosphine, dicyclohexyl-n-propyl-phosphine, dicyclohexyl-isopropylphosphine, dicyclohexyl-butylphosphine, dicyclohexyl-hexylphosphine, dicyclohexyl-octylphosphine, and tricyclohexylphosphine.

7. The process of Claim 4, wherein the amount of the catalyst is from 0.01 to 3 mol%, based on the molar amount of the isocyanate used.

8. The process of Claim 4, wherein at least one organic isocyanate comprises an isocyanate selected from aliphatic isocyanates, cycloaliphatic isocyanates and araliphatic isocyanates, wherein the organic isocyanate has an NCO functionality of greater than 2.

9. The process of Claim 8, wherein the isocyanate is one or more selected from the group consisting of hexamethylene diisocyanate, methylpentane diisocyanate, trimethylhexane diisocyanate, bis(isocyanatomethyl)-cyclohexane, norbornane diisocyanate, isophorone diisocyanate, bis(isocyanatocyclohexyl)methane, bis(isocyantomethyl)benzene and bis(2-isocyantoprop-2-yl)benzene (tetramethylxylylene diisocyanate.

10. The process of Claim 4, wherein the one or more additives comprise one or more selected from the group consisting of antioxidants, light stabilizers, weak acids, and catalysts.

11. The process of Claim 10, wherein the light stabilizer is a hindered amine light stabilizer.

12. The process of Claim 10, wherein the catalyst comprises dibutyltin dilaurate.

13. The process of Claim 4, wherein the solvent comprises one or more selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, alcohols, ketones, esters, and ethers.